

CLAIMS:

1. A method for using timing information as at least one input parameter for a function performed in a local device comprising steps for:
transmitting a message from the local device to a remote device via an ultra wide band (UWB) wireless medium;
receiving a response from said remote device via said UWB wireless medium;
determining an amount of time between said transmitting step being executed and said receiving step being executed; and
performing a function in said local device with said amount of time being said at least one input parameter.

2. The method of Claim 1, wherein said transmitting step and said receiving step are performed in accordance with a Media Access Control (MAC) protocol.

3. The method of Claim 1, further comprising determining a distance from said local device to said remote device based on said amount of time, wherein said step of performing a function in said local device comprises performing said function based on said distance determined.

4. The method of Claim 3, wherein:
said step of determining an amount of time includes substeps of:
marking as a first time when said message is transmitted from the local device,
marking as a second time when said response is received in said receiving step, and
determining a difference between said first and second times;
said step of determining a distance includes:
determining a processing delay that corresponds to a delay in time between when the remote device receives the message and when the remote device transmits said response,
determining a round trip time by subtracting said processing delay from the difference between said first and second times, and
multiplying one half of said round trip time by a speed of transmission over

the UWB wireless medium.

5. The method of Claim 4 wherein said step of determining a processing delay comprises receiving at said local device said processing delay from said remote device.

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6. The method of Claim 4, wherein said step of determining a processing delay comprises:

10 receiving at said local device a device type identifier from said remote device; and obtaining a predetermined delay related to said device type from a look up table stored in said local device.

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7. The method of Claim 3, wherein said step of performing a function in said local device comprises communicating with said remote device based on said distance determined.

15 8. The method of Claim 7, wherein said step of communicating with said remote device comprises substeps of:

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setting an authentication criteria in said local device;
comparing said authentication criteria with said distance between the local device and the remote device;

20 enabling communications with said remote device if said distance satisfies said authentication criteria; and

blocking communications with said remote device if said distance does not satisfy said authentication criteria.

25 9. The method of Claim 8, further comprising steps of:

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updating distance information after a predetermined time; and
enabling or disabling communications to said remote device based on the updated distance information.

30 10. The method of Claim 8, further comprising steps of:

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updating distance information only when communications to said remote device are blocked; and

enabling communications with said remote device based on the updated distance information.

11. The method of Claim 7, wherein said step of communicating with said remote device comprises substeps of:

5 determining a position of said remote device; and

selectively enabling communications with said remote device based on said position of said remote device.

10 12. The method of Claim 11, wherein said step of determining a position of said

remote device comprises substeps of:

determining another distance, from said local device to a reference point;

receiving information from said remote device indicating a third distance, from the remote device to the reference point; and

15 triangulating the position of the remote device based on said distance from the local device to the remote device, said another distance from the local device to the reference point and said third distance from the reference point to the remote device.

20 13. The method of Claim 12, further comprising steps of:

displaying a positional map including display indicators that represent said local device and said remote device on a display of said local device;

updating after a predetermined time positional information for said remote device; and

25 changing a display position of said remote device on said positional map after said updating step is performed.

14. The method of Claim 13, wherein said step of enabling communications with said remote device based on said position of said remote device comprises substeps of:

30 inputting a selection input at a screen position on said display;

determining whether the selection input corresponds to said display position for said remote device; and

enabling communications with said remote device if the selection input corresponds

to said display position for said remote device.

5 15. The method of Claim 14, wherein said step of inputting a selection input at a screen position on the display comprises inputting said selection input on a touch screen.

10 16. The method of Claim 14, further comprising a step of indicating on said display whether said remote device is enabled.

15 17. The method of Claim 11, wherein said step of determining a position of said remote device comprises substeps of:

20 determining distances from said local device to a plurality of reference points;
receiving information from said remote device indicating respective distances between the remote device to each of said plurality of reference points and distances between each of said plurality of reference points; and

25 15. triangulating the position of the remote device based on said distance from the local device to the remote device, said respective distances from the local device to the plurality of reference points and said distances from the remote device to each of said plurality of reference points and between each of said plurality of reference points.

30 20. The method of Claim 17, wherein said plurality of reference points comprises first, second, third, and fourth reference devices located in quadrature or management relative to a center point of an area in which the local device is located, said method further comprising steps of:

25 receiving information from each reference device about its respective location;
obtaining direction information about the direction in which the local device is facing, and

30 30. displaying a positional map including said local device, said remote device and said reference devices on a display of said local device, wherein said positional map is oriented on the display with the reference point that the local device is facing at a top center location of the display.

19. The method of Claim 7, wherein said step of communicating with said remote

device comprises engaging in secure communications with said remote device based on distance.

20. The method of Claim 1, wherein

5 said step of transmitting a message further includes transmitting a message from a local device to a plurality of remote devices within a communicating area of said local device via said UWB wireless medium;

10 said step of receiving a response further includes receiving a response from each of said plurality of remote devices via said UWB wireless medium;

15 said step of determining a round trip time further includes determining a round trip time between transmitting said message and receiving of said response for each of said plurality of remote devices; and

20 said step of performing a function in said local device includes performing a function in said local device based on said round trip times determined.

21. The method of Claim 20, further comprising:

25 establishing a unique communications link from said local device to each of said remote devices using a Media Access Control (MAC) protocol; and

30 determining a distance from said local device to each linked remote device based on said round trip times determined, wherein said step of performing a function in said local device based on the round trip times comprises enabling communications with said remote devices based on said distances determined.

22. The method of Claim 3, further comprising steps of:

35 determining a distance from said local device to another remote device.

23. The method of Claim 22, further comprising steps of:

40 using a directional antenna to identify a respective position, of said remote device and said another remote device.

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24. The method of Claim 23, wherein said using a directional antenna includes using a multi-element antenna.

25. The method of Claim 23, wherein said using directional antenna includes rotating said local device.

5 26. The method of Claim 22, further comprising a step of switching between antenna elements to identifying respective positions of said remote device and said another remote device.

10 27. A communications device comprising:
an ultra wide band (UWB) transceiver configured to:

15 transmit a message from the communications device to a remote device via a UWB wireless medium, and

receive a response from said remote device via said UWB wireless medium;
a memory device having embedded therein data related to using timing information as at least one input parameter for a function performed in the communication device; and

20 15 a processor in communication with said memory device, said processor configured to:
determine an amount of time between said transmitting of said message and
said receiving of said response, and
perform a function in said local device with said amount of time being said at
least one input parameter.

25 28. The communications device of Claim 27, wherein said transceiver is configured to transmit said message and receive said response in accordance with a Media Access Control (MAC) protocol.

30 29. The communications device of Claim 27, wherein said processor is further configured to:

determine a distance from said local device to said remote device based on said amount of time, and
perform said function based on said distance determined.

30 30. The communications device of Claim 29, wherein said processor is configured to perform said function by causing said communications device to communicate with said

remote device based on said distance determined.

31. The communications device of Claim 30, wherein said processor is further configured to:

5 determine a position of said remote device using said distance determined, and selectively enable communications with said remote device based on said position of said remote device.

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10 32. The communications device of Claim 30, wherein processor is configured to perform said function by causing said communication device to communicate with said remote device by secure communications with said remote device based on said distance determined.

15 33. The communications device of Claim 29, wherein said processor is further configured to:

15 33 determine a distance from said communications device to another remote device; and use a directional antenna to identify a respective position, of said remote device and said another remote device.

20 34. A communications device comprising:

means for transmitting a message from the communications device to a remote device via an ultra wide band (UWB) wireless medium;

means for receiving a response from said remote device via said UWB wireless medium;

25 means for determining an amount of time between said transmitting of said message and said receiving of said response; and

means for performing a function in said local device with said amount of time being at least one input parameter used to perform said function.

30 35. The communications device of Claim 34, wherein said means for transmitting and said means for receiving comprise means for transmitting and receiving in accordance with a Media Access Control (MAC) protocol.

36. The communications device of Claim 34, further comprising:
means for determining a distance from said local device to said remote device based
on said amount of time; and
5 means for performing a function in said communications device by performing said
function based on said distance determined.

37. The communications device of Claim 36, wherein said means for performing a
function in said communications device comprises means for communicating with said
10 remote device based on said distance determined.

38. The communications device of Claim 37, wherein said means for communicating
with said remote device comprises:
means for determining a position of said remote device; and
15 means for selectively enabling communications with said remote device based on said
position of said remote device.

39. The communications device of Claim 37, wherein said means for communicating
with said remote device comprises means engaging in secure communications with said
20 remote device based on said distance determined.

40. The communications device of Claim 36, further comprising:
means for determining a distance from said communications device to another remote
device; and
25 means for using a directional antenna to identify a respective position, of said remote
device and said another remote device.

41. A computer readable medium containing program instructions for executing on a
communications system, which when executed by the communications system, cause the
30 communications system to perform the steps of:

transmitting a message from the local device to a remote device via an ultra wide band
(UWB) wireless medium;

receiving a response from said remote device via said UWB wireless medium;
determining an amount of time between said transmitting step being executed and said
receiving step being executed; and
5 performing a function in said communications device with said amount of time being
at least one input parameter used to perform said function.

Sub 42. The computer readable medium of Claim 41, wherein the communications system
is further caused to perform said transmitting and receiving steps in accordance with a Media
Access Control (MAC) protocol.

10 43. Computer readable medium of Claim 41, wherein the communications system is
further caused to perform said step of performing a function in said communications device
by performing said function based on said distance determined.

15 44. Computer readable medium of Claim 43, wherein the communications system is
further caused to perform said step of performing a function in said communications device
by communicating with said remote device based on said distance determined.

20 45. Computer readable medium of Claim 44, wherein the communications system is
further caused to perform said step of communicating with said remote device by:
determining a position of said remote device; and
selectively enabling communications with said remote device based on said position
of said remote device.

25 46. Computer readable medium of Claim 44, wherein the communications system is
further caused to perform said step of communicating with said remote device by engaging
in secure communications with said remote device based on distance.

30 47. Computer readable medium of Claim 43, wherein the communications system is
further caused to perform steps of:
determining a distance from said communications device to another remote device;
and

Step B

using a directional antenna to identify a respective position, of said remote device and
said another remote device.